

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
SPECIFICATION FOR
WRENCHES, SPANNER, FIRE HOSE

1. SCOPE.

1.1. Scope. The spanner wrenches described in this specification are used to tighten and loosen Forest Service couplings with rocker lugs, slotted or pin lugs. Designed to be lightweight, a spanner is easily carried and fits in the firefighter's trouser pocket. Single-ended spanner wrenches fit 1 inch 11-1/2 NPSH and 1-1/2 inch 9 NH couplings. Double-ended spanner wrenches fit 1 inch 11-1/2 NPSH, 1-1/2 inch 9 NH and 2-1/2 inch 7-1/2 NH couplings.

2. APPLICABLE DOCUMENTS.

2.1. Government Documents. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the invitation for bids or request for proposals (see 6.2).

USDA Forest Service Specifications

5100-102 - Couplings, Fire and Suction Hose

5100-108 - Couplings, Lightweight, Fire Hose

Federal Specification

QQ-A-367 - Aluminum Alloy, Forgings

Copies of federal specifications are available from General Services Administration, Federal Supply Service Bureau, Specification Section, Suite 200, 470 East L'Enfant Plaza SW, Washington DC 20407.

Beneficial comments, recommendations, additions, deletions and any pertinent data that may be used in improving this document should be addressed to: USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198 by using the Specification Comment Sheet at the end of this document, or by letter.

Copies of USDA Forest Service Specifications and Standards are available from USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198.

2.2. Non-Government Publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the invitation for bids or request for proposals (see 6.2).

American National Standards Institute Inc. (ANSI)/American Society For Quality Control (ASQC)

Z 1.4 - Sampling Procedures and Tables for Inspection by Attributes

Address requests for copies to the American National Standards Institute Inc., 11 West 42nd Street, New York, NY 10036.

American Society for Testing and Materials (ASTM)

B 26 - Aluminum-Alloy Sand Castings

B 124 - Standard Specification for Copper and Copper Alloy Forging Rod, Bar and Shapes

B 584 - Standard Specification for Copper Alloy and Sand Castings for General Applications

E 380 - Practice for Use of the International System of Units

Address requests for copies to American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

Non-Government standards and other publications normally are available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.

2.3. Order of Precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS.

3.1. First Article. Unless otherwise specified, first article inspection shall be performed on a product sample(s) in accordance with 4.4.3.

3.2. Construction. Spanner wrench configuration shall be as shown in Figures 1 and 2. There are two types of spanner wrenches, single- and double-ended. The single-ended spanner wrench is configured to fit 1 inch 11-1/2 NPSH and 1-1/2 inch 9 NH couplings. The double-ended spanner wrench is configured to fit 1 inch 11-1/2 NPSH, 1-1/2 inch 9 NH, and 2-1/2 inch 7-1/2 NH couplings. The couplings are as qualified in accordance with USDA Forest Service Specifications 5100-102 or 5100-108. Spanner wrenches shall be cast or forged.

5100-101c

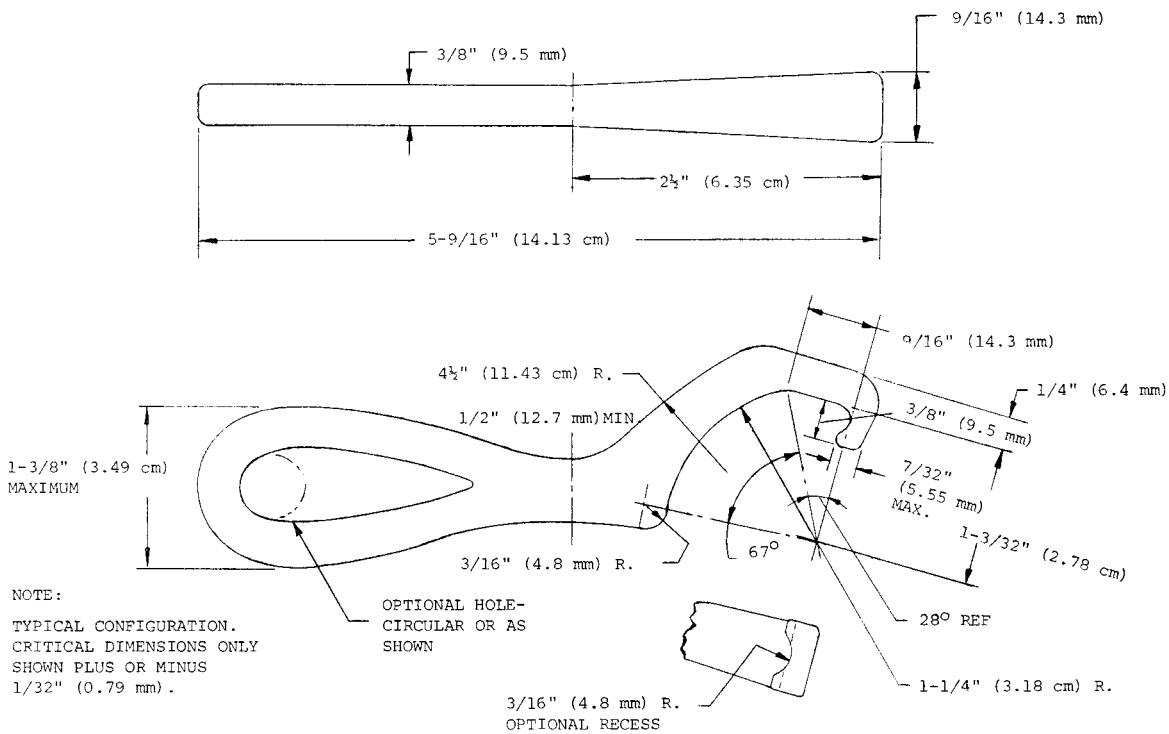


Figure 1. Single-ended spanner wrench configured to fit 1 inch and 1-1/2 inch couplings.

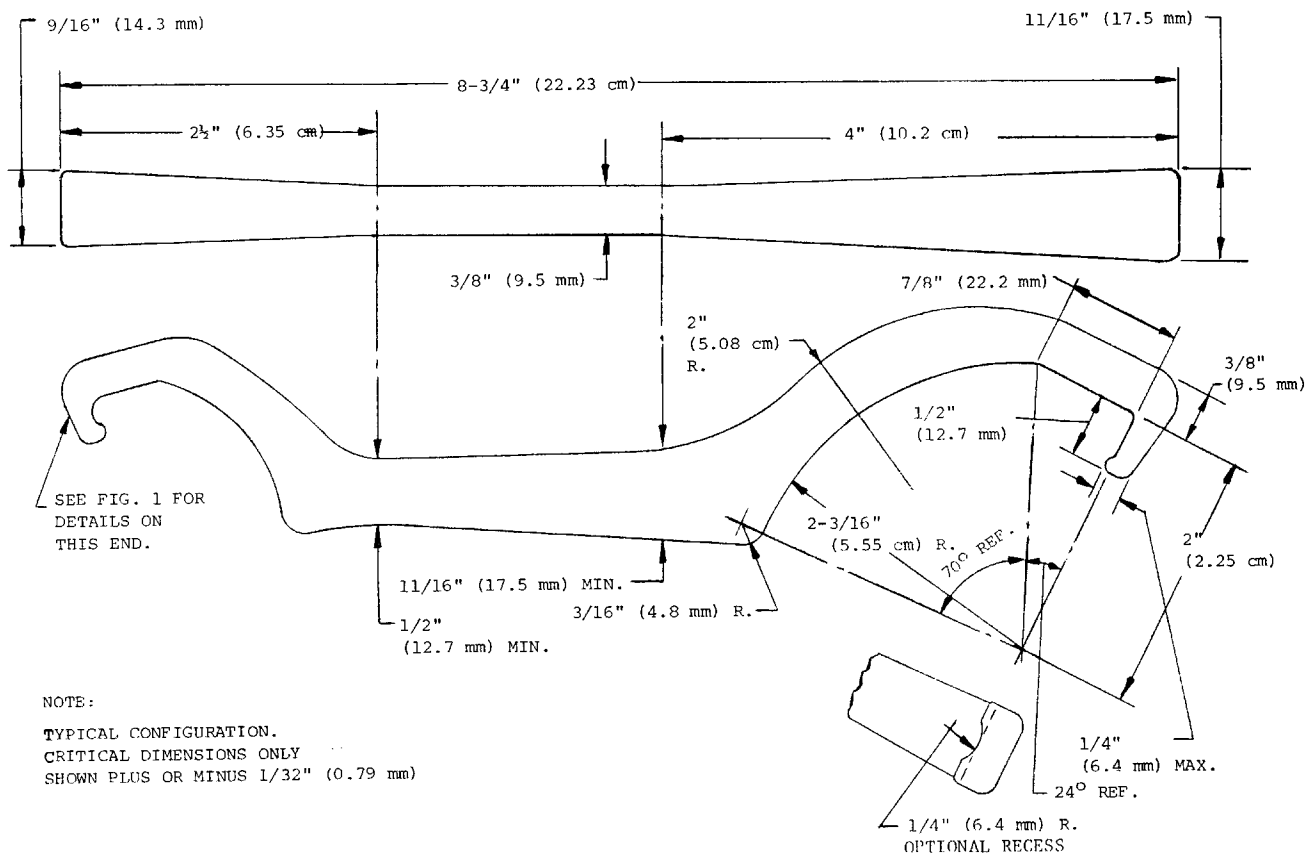


Figure 2. Double-ended spanner wrench configured to fit 1 inch, 1-1/2 inch and 2-1/2 inch couplings.

3.3. Materials. Spanner wrench material shall be a lightweight aluminum alloy material.

3.3.1. Lightweight. Lightweight aluminum alloy material shall conform to the following:

- a. Cast aluminum alloy, 356-T6, in accordance with ASTM B 26 or
- b. Forged aluminum alloy, 6061 T6, in accordance with Federal Specification QQ-A-367

3.3.2. Brass. If otherwise specified in lieu of lightweight aluminum alloy (see 6.2), brass material shall conform to the following:

- a. Cast manganese bronze, alloy number C86200 or C86300, in accordance with ASTM B 584 or
- b. Forged brass C37700 in accordance with ASTM B 124.

3.3.3. Recoverable Materials. The contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR), provided all performance requirements of this specification are met.

3.4. Dimensions and Weight. Dimensions shall be as shown in Figures 1 and 2. The maximum weight shall be as indicated in Table 1.

Table 1. Spanner Wrench Maximum Weight

Spanner Type	Lightweight Aluminum Alloy		Brass	
	Maximum ounce	Maximum gram	Maximum ounce	Maximum gram
Single-end	2.5	71.3	6.5	185.3
Double-end	4.5	128.3	11.5	328.0

3.4.1. Decimal Dimensional Tolerance. Unless otherwise noted, the following tolerances apply: one place (x.x) +/- 0.1 inch (2.5 mm); two places (x.xx) +/- 0.01 inch (0.25 mm) and three places (x.xxx) +/- 0.010 inch (0.254 mm).

3.4.2. Fractional Dimensional Tolerance. Unless otherwise noted, the tolerances for fractions shall be +/- 1/32 inch.

3.5. Workmanship. Workmanship shall be equal to the best commercial practices consistent with the highest engineering standards in the industry and shall be free from any defect which may impair serviceability or detract from the product's appearance.

3.5.1. Symmetry. All metal part sections shall be symmetrical.

3.5.2. Forged Components. Forged sections shall be free from laps, sharp die marks, cracks or other defects. Surfaces shall be smooth and have a roughness of not more than 125 μ inches (3.2 μ m).

3.5.3. Cast Components. Cast parts shall be fine-grained, free from blowholes, pinholes, pits, porosity, hard spots, shrinkage, cracks or other defects. Exterior surfaces shall be smooth and cleaned by sandblasting, tumbling, or other accepted standard commercial process.

3.6. Marking. Markings shall be permanently and legibly marked, on the outside surface of the spanner, with the manufacturer's name or trademark, and the letters "FSS". The minimum letter height shall be 0.12 inch (3.05 mm).

3.7. Performance. In addition to the following impact resistance test, the spanner wrench shall be capable of tightening and loosening a qualified fire hose coupling.

3.7.1. Impact Resistance. When tested in accordance with 4.6.1, there shall be no breaks, cracks, or other physical damage to the spanner wrench.

3.8. Metric Products. Metric dimensions are provided for information only, inch-pound units shall be the required units of measure for this specification. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within the tolerances specified using conversion tables contained in the latest revision of ASTM E 380, and all other requirements of this specification are met.

4. INSPECTION, SAMPLING AND TEST PROCEDURES.

4.1. General Inspection and Tests. Unless otherwise specified in the contract or purchase order, the contractor is responsible for performance of all inspection requirements prior to submission for Government acceptance inspection and tests. The contractor may utilize their own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government.

4.1.1. Inspection and Test Site. The Government shall conduct lot acceptance inspection and tests to determine compliance with the specification. If lot acceptance and tests are conducted at locations other than the manufacturing facilities, the contracting officer will specify location and arrangements. In the case of on-site inspections at the contractor's facility, the contractor shall furnish the inspector all reasonable facilities for their work. During any inspection, the inspector may take from the lot one or more samples and submit them to an independent test laboratory approved by the Government or to a Government test facility for inspection and tests.

4.1.2. Testing With Referenced Documents. The contractor is responsible for ensuring that components and materials used were manufactured, examined and tested in accordance with referenced specifications and standards. The Government reserves the right to perform any of the inspections or tests set forth in this section where such action is deemed necessary to assure supplies and services conform to prescribed requirements.

4.2. Responsibility for Compliance. All items shall meet all requirements of sections 3 and 4. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in this specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.3. Sampling for Inspection. When inspection is performed, sampling shall be in accordance with ANSI/ASQC Z 1.4.

4.3.1. Lot. All spanner wrenches of one size presented together in one delivery shall be considered a lot for the purpose of inspection. A sample unit shall be one spanner wrench.

4.3.2. Sampling for Visual and Dimensional Examination. Sampling for visual and dimensional examination shall be S-2, with an Acceptable Quality Level (AQL) of 1.5 percent defective.

4.3.3. Sampling for Lot Acceptance Tests. Sampling for lot acceptance testing shall be level S-2, with an AQL of 1.5 percent defective.

4.4. Inspection and Tests.

4.4.1. Visual and Dimensional Examination. When selected in accordance with 4.3.2, each spanner wrench shall be visually and dimensionally examined to determine conformance with this specification. Visual or dimensional defects shall be classified as major or minor. A defect not listed in Table 2 shall be classified as a minor defect. If the number of defects in any sample exceeds the indicated AQL, the lot shall be rejected.

Table 2. Major and Minor Defects

Defect	Classification	
	Major	Minor
1. Spanner wrench not complete.	X	
2. Material and construction not as required.	X	
3. Dimensions and weight not as required.	X	
4. Workmanship not as required.	X	
5. Markings not as required.		X

4.4.2. Lot Acceptance Tests. Each of the samples selected in accordance with 4.3.3, shall be tested in accordance with 4.6, to determine conformance with the requirements of this specification.

4.4.3. First Article Inspection. Unless otherwise specified (see 6.2), the first article sample(s) indicated in 3.1, shall be inspected as specified in 4.4.1 and 4.6. All inspection and testing of the first article sample(s) shall stop upon a single failure and the sample(s) rejected. The contractor will be informed as to the nature of the failure, but the Government shall not be obligated to continue testing a defective item, once it is known to be defective or when it is considered in the best interest of the Government.

4.4.4. Quality Conformance Inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z 1.4. The inspection level and AQL shall be as specified in 4.3.3.

4.5. Certificate of Conformance. Where certificates of conformance are required, the Government reserves the right to verify test any such items to determine the validity of certification. These certificates shall be based on the testing of component materials and may be performed by the material supplier. The contractor shall provide certificates of conformance for all materials used in 3.3. (see 4.5.2.).

4.5.1. Certificates of Conformance in Lieu of Testing. Unless otherwise specified, certificates of conformance may be acceptable in lieu of testing end items.

4.5.2. Material. As required by 3.3, spanner wrench material shall meet the indicated material physical property requirement listed, when tested to defined test method.

4.6. Performance Testing. Samples shall be subjected to the following test to determine if the samples meet the requirements of this specification. In addition to the following impact resistance test, the spanner wrench shall be capable of tightening and loosening a qualified fire hose coupling.

4.6.1. Impact Resistance Test. As required by 3.7.1, the spanner wrench shall be tested for impact resistance. The wrench shall be dropped in a free fall from a height of 8.0 foot \pm 3 inches (2.44 m \pm 76.2 mm) to a flat concrete surface. The wrench shall be dropped three consecutive times from three different positions to impact at three different points on the wrench. The wrench shall be examined after the third drop for damage.

5. PACKAGING, PACKING AND MARKING

5.1. Packaging, Packing and Marking. The packaging, packing and marking shall be as specified in the contract or order.

6. NOTES.

6.1. Intended Use. The spanner wrenches described in this specification are used to tighten and loosen Forest Service couplings with rocker lugs, slotted or pin lugs. Designed to be lightweight, a spanner is easily carried and fits in the firefighter's trouser pocket.

6.2. Acquisition Requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. If a first article sampling and inspection is not required (see 3.1, 4.4.3, and 6.3).
- c. If brass is preferred.
- d. Type/size of wrench required. The single-ended wrench fits 1 inch and 1-1/2 inch couplings, and the double-ended spanner wrench fits 1 inch, 1-1/2 inch and 2-1/2 inch couplings (3.2).
- e. If certificates of conformance are acceptable in lieu of lot by lot testing (see 4.5).
- f. Packaging, packing and marking (see 5.1).
- g. Date of the invitation for bids or request for proposals (see 2.1).

6.3. First Article. When a first article sample(s) is required, it shall be inspected and approved in accordance with the First Article clauses set forth in the solicitation. Specific instructions shall be included regarding arrangements for selection, inspection, and approval of the first article sample(s).

6.4. Notice. When Government drawings, specifications, or other data are used for any purpose other than in connection with a related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever.

6.5. Preparing Activity. USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, CA 91773-3198.

**United States Department of Agriculture, Forest Service
Standardization Document Improvement Proposal**

Instructions: This form is provided to solicit beneficial comments which may improve this document and enhance its use. Contractors, government activities, manufacturers, vendors, or other prospective users of this document are invited to submit comments to the USDA Forest Service, San Dimas Technology and Development Center, 444 East Bonita Avenue, San Dimas, California 91773-3198. Attach any pertinent data which may be used in improving this document. If there is additional documentation, attach it to the form and place both in an envelope addressed to the preparing activity. A response will be provided when a name and address are included.

Note: This form shall not be used to submit request for waivers, deviation, or for clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

Standard Number and Title: **Specification 5100-101c, Wrenches, Spanner, Fire Hose**

Name of Organization and Address:

_____ Vendor _____ User _____ Manufacturer

1. _____ Has any part of this document created problems or required interpretation in procurement use?
_____ Is any part of this document too rigid, restrictive, loose or ambiguous? Please explain below.

Give paragraph number and wording:

Recommended change(s):

Reason for recommended change(s):

Remarks:

Submitted by: (Print or type name and address—Optional)

Telephone number: (Optional)

Date:

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